FIGURE 2

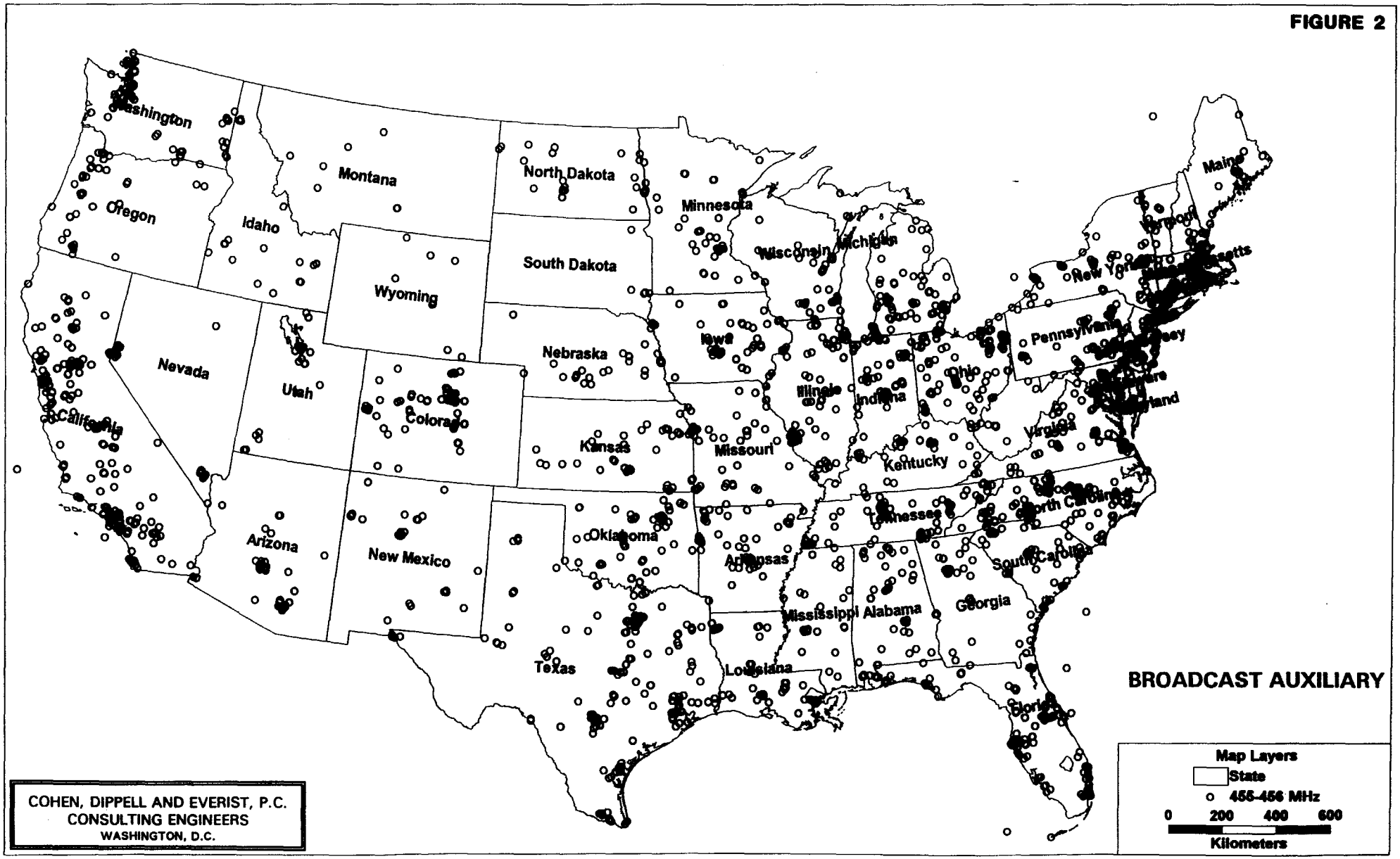

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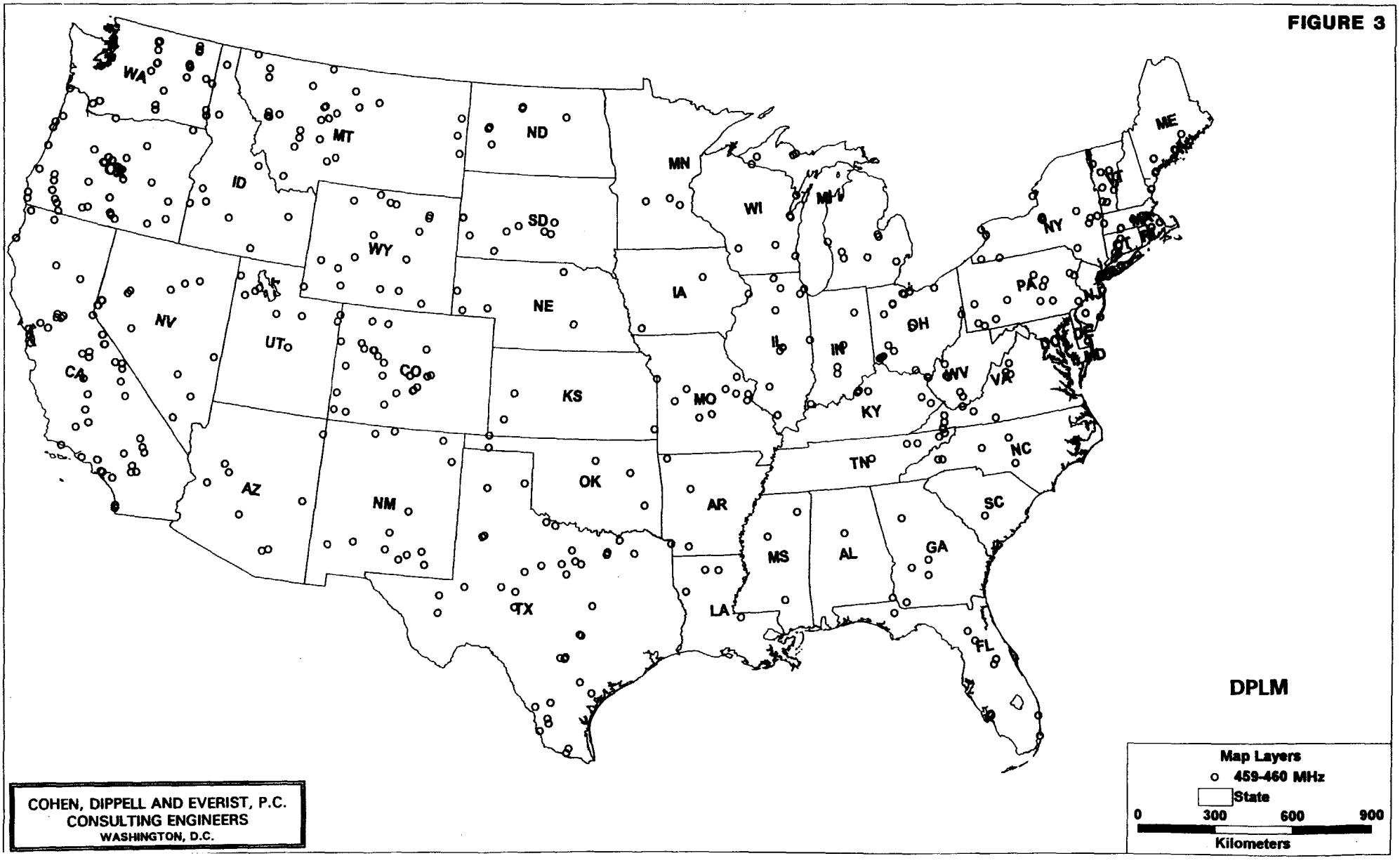
FIGURE 3



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APPENDIX B

Appendix B:
Inter-Service Sharing Considerations Between Government Radar Stations and NVNG MSS

1. Wind Profiler Radar

A feeder gateway mainbeam EIRP is 16.6 dBW with approximately 14 dBi antenna gain and 32° antenna beamwidth. Operation at a 15° terminal elevation angle implies that the -3 dB portion of the antenna is pointing at the -25 dB sidelobe of the Profiler Rader. A 43 kHz feeder link transmission bandwidth and 30 dB spectral roll-off within the Radar bandwidth implies a spectral density of -63 dBW/Hz peak spectral density within the assumed -30 dB spectral side-lobe.

The published Type A Wind Profiler Radar characteristics specify a -124.9 dBm noise level in a 100 kHz bandwidth. This implies a -174.9 dBm/Hz noise spectral density. To obtain an interference spectral density 16.3 dB down from the noise floor, corresponding to 0.1 dB noise floor degradation, requires the gateway terminal spectral density to be reduced to -191.2 dBm/Hz. This implied 128.2 dB rejection corresponds to a gateway terminal to Profiler radar stand-off distance of 85 miles (136 km). This distance may generally be over the radio horizon from the radar site. Thus, gateway terminal locations greater than 100 miles from a Profiler radar site are desired.

Likewise, NVNG MSS satellite receivers should be able to tolerate the high power out-of-band interference. Feeder gateway ground station sites can be selected so that feeder link errors and outages caused by Wind Profiler radar pulse reception is minimized.

2. SPASUR

SPASUR transmit frequency is stated to be 216.98 MHz (± 1 Hz). The 1991 NTIA Report, "Assessment of Bands for Wind Profiler Accommodation," specifies the SPASUR radar receiver characteristics, including a noise level of -131 dBm in an IF bandwidth of 32 kHz. This corresponds to a noise floor of -176 dBm/Hz. An achievable feeder downlink received isotropic power (RIP) within a 43 Hz gateway signal bandwidth is -112.7 dBm. This corresponds to a 5 dBW EIRP and an isoflux satellite antenna pattern.

Even if a conservative assumption is made to ignore the expected feeder signal spectral roll-off and the SPASUR radar antenna sidelobe rejection, reasonable satellite transmitter output filter characteristics can result in less than 0.1 dB SPASUR radar receiver noise floor degradation. Reasonable assumptions imply this degradation is totally negligible. The feeder signal in-band spectral density is -159 dBm/Hz. A 0.1 dB increase in the SPASUR radar receiver noise floor requires no more than a -192 dBm/Hz interference spectral density in the radar bandwidth. This corresponds to a requirement of greater than 33 dB filter rejection. A 40 dB rejection can be achieved at a frequency offset 1.75 times greater than the transmitter passband.

If the satellite transmitter passband is assumed to be the entire 0.5 MHz from 216.0 to 216.5 the 40 dB point of this response is at 216.88 MHz. This is the edge of the published radar bandwidth. If the satellite transmitter output noise floor is considered, a 10 dB final power amplifier gain and a 10 dB final power amplifier noise figure result in a power level at the SPASUR radar receiver greater than 100 dB below the 0.1 dB degradation level. Thus, simultaneous operation when the satellite is not in the SPASUR antenna beam is easily possible. The narrow

SPASUR antenna beam widths and the conservative feeder signal spectral roll-off and the SPASUR radar antenna gain assumptions imply that even during the infrequent instances when a satellite is in the SPASUR antenna mainbeam SPASUR degradation may be acceptably small.

SPASUR radar out-of-band emissions in the 216.88-217.08 MHz band are not likely to affect feeder downlink receivers. The feeder gateway ground station sites can be chosen so that the out-of-band rejection achievable by a ground station receiver is adequate to eliminate any degradation due to transmitted signals from the three SPASUR transmitter sites. SPASUR out-of-band emissions into the downlink channels should be low enough that site selection is sufficient to eliminate any degradations.

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Engineer's Certification

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this Joint Supplemental Reply Comments, that I am familiar with the Commission's Rules, that I have either prepared or reviewed the engineering information submitted to these Comments, and that it is complete and accurate to the best of my knowledge.

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Dated: May 18, 1995

CERTIFICATE OF SERVICE

I, Felecia G. DeLoatch, do hereby certify that a true and correct copy of the foregoing "Joint Supplemental Reply Comments" was sent by first-class mail, postage prepaid, or hand-delivered, on this 18th day of May, 1995, to the following persons.

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